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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/020,911
Filing Date: December 19, 2001
Appellant(s): VANDENTOP ET AL.

B. Delano Jordan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/5/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-4 and 14-16 and 31 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

Fan et al., "Copper Wafer Bonding", Electrochemical and Solid State Letters, 2(10), (1999) pp. 534-536.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 14-16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Fan et al., "Copper Wafer Bonding", Electrochemical and Solid State Letters, 2 (10), pp. 534-536, 1999.

Applicant's admitted prior art teaches a method of fabricating an electro-optic package comprising:

providing an IC wafer having one or more IC contact pads, the IC pads being connected to an IC on the wafer;

providing an intermediate wafer having one or more intermediate contact pads, the intermediate contact pads being connected to an electro-optic arrangement on the intermediate wafer ((0003J-(0005)).

Applicant's admitted prior art fails to teach direct copper bonding the IC contact pads to adjacent intermediate contact pads, the electro-optic semiconductor package resulting.

Fan teaches the use of direct copper bonding to attach device wafers.

Even though Fan does not teach either wafer having an electro-optic arrangement thereon, it would have been obvious to one of ordinary skill in the art to use the direct copper bonding of Fan in Applicant's admitted prior art because Fan

teaches that interconnect delays are significantly reduced and system performance is increased (first paragraph).

As taught be Fan, direct copper bonding is known in the art. Therefore, the present invention is a new use for a known method. Merely finding a new application for a known method is unpatentable.

The use of old process steps employing new materials is unpatentable. In re Maxwell et al., 89 USPQ 387 (CCPA).

Regarding claims 2-4, Fan teaches cleaning the contact pads in an acid bath (claim 3), disposing the IC contact pads adjacent the intermediate contact pads in an oxidation-resistant environment comprising a nitrogen purge (claim 4) having a predetermined ambient temperature, and forcing the IC contact pads into direct contact with the adjacent intermediate contact pads at a predetermined temperature, resulting in a direct copper bond (under the heading Experimental).

With respect to claim 14, Applicant's admitted prior art teaches a computer processor wafer having one or more contact pads (100031).

As to claim 15, Applicant's admitted prior art teaches providing a chip interposer as the intermediate wafer ((0003)).

Regarding claim 16, Applicant's admitted prior art teaches providing a host wafer as the intermediate wafer (0003)).

With respect to newly added claim 31, the direct copper bonding enabling optical losses associated with the electro-optic semiconductor package to be minimized is an

inherent property of direct copper bonding. This property would be inherent to the direct copper bonding of Fan (see MPEP 2112).

(11) Response to Argument

It is argued that there is no motivation to modify Fan to arrive at an electro-optic package because Fan is limited to the electrical advantages of direct copper bonding and does not mention any optical devices.

The examiner takes the position that the rejection is being attacked in a piece meal manner. Fan is relied upon to teach that direct copper bonding is known in the art. The examiner relied upon applicant's admitted prior art to teach that electro-optic packages are known in the art.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Also, seeing as Fan teaches that direct copper bonding is a known in the art method, the optic advantages of using direct copper bonding would be inherent properties.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There

is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims (MPEP 2112).

Along the same line of reasoning, as stated in the previous office action, the examiner states that the present invention is merely a new use for a known process, which is unpatentable. Therefore, the taking of the known in the art method of direct copper bonding, and its use in electrical packages, and applying it to electro-*optic* packages is unpatentable.

The use of old process steps employing new materials is unpatentable. In re Maxwell et al., 89 USPQ 387 (CCPA).

Since the examiner's assertions that 1) Fan teaches that interconnect delays are significantly reduced and system performance is increased would be a significant advantage, regardless of its lack of mentioning any optical advantages, and 2) that the present invention is merely a new use for a known process were not challenged and/or are still valid motivational statements, no further evidence is required.

Also argued is that the only source of alleged motivation is found in Appellant's own disclosure.

The examiner asserts that this is incorrect. The motivation for combining Fan with Applicant's admitted prior art is founding Fan, which states "significant reduction of

interconnect delays and an increase in system performance" is achieved using direct copper bonding (first paragraph).

The third argument presented with respect to claim 31, is that the assertion that the optical advantages of the claimed package would be an inherent property is unclear.

What the examiner is asserting is that minimization of optical losses claimed in claim 31 is inherent to direct copper bonding. This limitation does not further limit the claim, because the minimization of optical losses is inherent to direct copper bonding and not an added structural limitation or an added process step.

While unclear what exactly is being argued, it appears that the final argument presented is that the assertion that the case law cited regarding the use of old process steps employing new materials is unpatentable is inappropriate because the specifics of the case are different.

The rejection is applying case law outlined in MPEP 2144 that has been generally accepted as setting a precedent. While it is correct that the specifics are different, it is believed that it applies because the only difference between the prior art and the claimed invention is that an electro-*optic* device is being used as opposed to a purely electrical device. Therefore, it is asserted that the claimed invention has merely found a new use for a known process.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Primary Examiner
December 7, 2004

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